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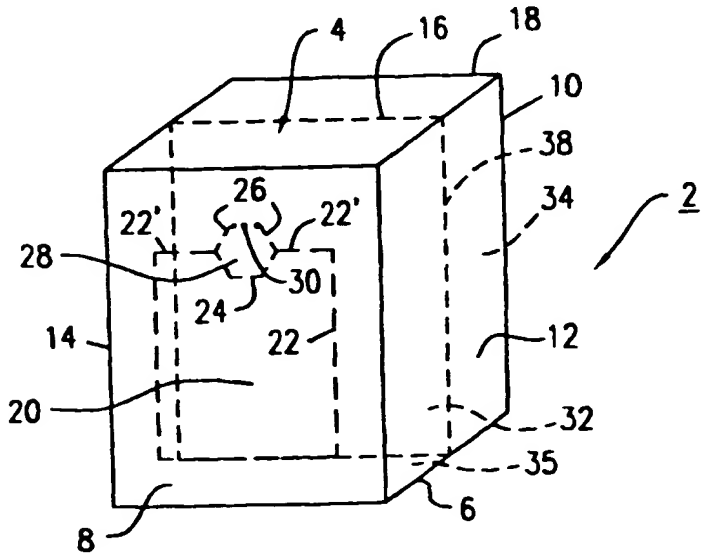
(54) Title: CONTAINER FOR ODOR REMOVER AND ETHYLENE ABSORBENT



(57) Abstract: A paper board one piece container (2) is formed by top, bottom, side, front and rear walls (4, 6) forming a chamber divided into two compartments by an interior wall which provides fluid isolation between the two compartments (34, 36). Each compartment has a container outer wall with a removable panel forming an opening in the outer wall. The opening is sealed with a permeable liner for permitting air to flow into the compartments while entrapping powder particles in the compartments. An odor absorbing powder such as sodium bicarbonate is in the larger of the two compartments and ethylene absorbing potassium permanganate material is adsorbed to zeolite wrapped in a fibrous plastic film wrap such as Tyvek in the second smaller compartment. Other embodiments are disclosed.

CONTAINER FOR ODOR REMOVER AND ETHYLENE ABSORBENT

Related Applications

This application claims priority of commonly owned provisional applications serial no. 60/161,517 filed October 25, 1999 and serial no. 60/179,348 filed January 31, 2000.

Description of the prior art

Refrigerators are cooling and storage devices for a variety of foods including fruits and vegetables. After a passage of time foods in refrigerators tend to develop odors. Equally, with the passage of time, fruits and vegetables rot or over ripen which also gives rise to odors. It has been known for many years to remove a large part of these odors by placing into the refrigerator a dish or container of powdered odor absorbent such as borax or sodium bicarbonate.

U.S. Patent No. 4,624,366 discloses a box containing such odor absorption material wherein air circulating in the refrigerator circulates over the absorbent. In this patent, the absorbent is disclosed as sodium bicarbonate which is in powder form. The box is a three dimensional trapezoid with 10 to 90% of each of the side portions open to admit air. The sodium bicarbonate is a powder. To contain the powder in the container with the side portions open to the ambient atmosphere, the openings in the side portions are covered with a porous gas permeable membrane or liner. The liner may be tubular or may be partial and cover only the openings of the side portions. The partial liner is glued to the interior of the carton so that the perimeter of the openings are sealed by the liner.

The membrane liner may be woven or non-woven fabric or paper with sufficient porosity to keep particles in the container without sifting, the particles having a particle size of about 10 microns or larger. The liner also has a bursting strength of about 5-30 pounds per square inch to preclude rupturing in use. Such membranes may be rice paper, spun woven mats,

synthetic fibers, non-woven fabrics and so on. The sides of the container all have openings so that air may pass through the container and through the odor absorption powder in the container. This patent is incorporated by reference in its entirety herein. However, this device only removes odors.

When fruits or vegetables ripen they release ethylene. Ethylene is a gas which not only is released by ripening fruit, but also accelerates the ripening of other fruits and vegetables in their vicinity. Thus, as recognized by the present inventor, it would also be desirable to remove ethylene from a closed environment such as a refrigerator in order to retard the accumulation of ethylene and, thus, retard the ripening or rotting of the vegetables or fruits. This ripening is undesirable and the present inventor recognizes a need to resolve this problem.

Summary of the Invention

A container for receiving material for absorbing odors and ethylene according to the present invention comprises a housing forming an enclosed chamber. Means form the chamber into first and second compartments, the first compartment for receiving the odor absorbing material and the second compartment for receiving the ethylene absorbing material, the housing having a first removable panel forming a first opening for providing air flow into the first compartment, a second removable panel coupled to one of the housing and second compartment forming a second opening in the housing or second compartment for providing air flow into the second compartment.

In one aspect, a gas permeable liner is coextensive with at least one of the first panel and with the second panel and sealed to the one of the housing and second compartment to preclude powder particles from passing through at least one of the first and second openings upon removal of the at least one first and second panels while permitting gas to flow into the compartments.

In a further aspect, the housing has a second wall with the second panel therein for providing fluid communication into the second compartment. Preferably, the container comprises one piece paper board.

In a further aspect, the ethylene absorber, suitably Potassium and Sodium Permanganate ($K/NaMnO_4$), Periodic Acid (H_5IO_6), Calcium Permanganate ($Ca(MnO_4)_2$), and Potassium Iodate (KIO_3), most suitably potassium permanganate is included into a high surface area carrier such as silica gel or zeolite and wrapped in a permeable plastic film placed in the second compartment.

In a still further aspect, odor absorbing powdered particles are in the first compartment. These may include but are not limited to Borax (sodium Tetra borate $B_4Na_2O_7$), Activated Charcoal (Carbon, Amorphous), Calcium Permanganate ($CaMn_2O_8$), Potassium Bicarbonate ($KHCO_3$), Silica Gel. (Precipitated Silica Approx. H_2SiO_3), Calcium Chloride ($CaCl_2$) and Calcium Hypochlorite ($CaCl_2O_2$)

In a further aspect, the means forming the chamber into first and second compartments includes an interior wall fluid isolating the first and second compartments, the first and second panels for providing independent fluid flow into the respective corresponding compartments.

In a further aspect, the first and second panels are on opposite walls of the housing, the interior wall preventing fluid flow between the first and second compartments.

The housing preferably has top and bottom walls, a front wall and a rear wall and two opposing side walls interconnected to form the chamber, the side, front and rear walls are hinged to each other by fold lines, the interior wall being hinged to one of the side, front or rear walls by a fold line,

and the top and bottom walls being formed by flaps hinged to selected side, front and rear walls by fold lines.

In a further aspect, sodium bicarbonate is in the first compartment and potassium permanganate is in the second compartment.

In a further aspect, means are provided for isolating the sodium bicarbonate from the potassium permanganate.

A container according to a further aspect comprises a housing forming a chamber and means for dividing the chamber into first and second compartments. Means are provide for permitting ambient atmosphere air flow into the first and second compartments with means for absorbing odor in the first compartment and means for absorbing ethylene in the second compartment.

IN THE DRAWING:

FIGURE 1 is an isometric view of a container according to an embodiment of the present invention;

FIGURE 2 is a front elevation view of the container of the present invention with its shipping panels removed to permit access to the container interior by ambient atmosphere gas;

FIGURE 3 is a sectional plan view of the container of Fig. 2 taken along lines 3-3;

FIGURE 4 is an isometric view of a shipping panel removed from the container of Fig. 2;

FIGURE 5 is a fragmented isometric sectional view of the container of Fig. 1;

FIGURE 6 is a fragmented isometric view of a liner employed with the container of Fig. 1;

FIGURE 7 is an isometric view of the container of the present embodiment with the enclosure flaps open;

FIGURE 8 is a plan view of a blank forming the container of Fig. 1 without the liner and absorption materials in place;

FIGURES 9 and 10 are isometric front and rear views of a container according to a second embodiment of the present invention;

FIGURES 11 and 12 are isometric front and rear views of a container according to a third embodiment of the present invention; and

FIGURE 13 is an isometric front view of a container according to a fourth embodiment of the present invention.

Discussion of the preferred embodiments

In Fig. 1, container 2 forms a housing and comprises a one piece paper board construction such as cardboard or other stiff paper sheet material. In the alternative, the container 2 may be molded thermoplastic material, also of one piece construction, or other materials as noted in the aforementioned patent incorporated by reference herein such as kraft paper, corrugated paper board, pressed paper board and so on. The container 2 has identical juxtaposed top and bottom planar rectangular walls 4 and 6, respectively, identical juxtaposed rectangular planar front and rear walls 8 and 10 and juxtaposed rectangular planar side walls 12 and 14. Top wall 4, representative of the bottom wall 6, comprises two overlapping flaps 16 and 18 glued together to form a seal there between (See also Figs. 7 and 8). In Fig.7, flaps 72 and 74 underlie flaps 16 and 18. The container 2 is preferably rectangular in all cross sections.

The front wall 8, which is representative of the rear wall 10, has a removable panel 20 as does the rear wall 10 and which is generally rectangular, but may be other shapes as desired. The panel 20 is defined by a series of perforation cuts 22 shown as a dashed line. The cuts 22 are through cuts forming interconnected perforations arranged so that the panel 20 may be easily separated from the remainder of the front wall 8 at the cuts 22. Cuts 22' are contiguous with a central semi-circular set of cuts 24. Two sets of linear cuts 26 are coupled to cuts 24 to form a tab 28.

Tab 28 is connected to the front wall 8 by a fold line 30 shown as a series of dots forming a hinge for the tab 28. Generally, through cuts are shown by solid lines and fold lines are shown as dashed lines. The rear wall 10 has an identical set of cuts forming a second panel (not shown in Fig. 1) identical to panel 20 on the rear wall 10. The panel 20 is made as large as possible and may be about 50 to 80% of the front area of front wall 8 and rear wall 10. Tearing of the panel at the perforation cuts 22, 22' and 26 permits the panel 20 to be removed. The tab 28 facilitates such removal by tearing the cuts 26 first and then folding the tab 28 back at fold line 30. This tab area frees up the fingers for gripping the panel 20 to permit tearing the panel 20 free of the front wall at the cuts 22. The panel 20, Fig. 4, is generally rectangular with a recess 23 in one edge formed by the tab 28. The removable panels 20 thus are defined by a single continuous set of perforations. The tab 28, which is optional, is located at one edge of the panel to assist in panel removal.

In Figs. 2 and 5, the container (or housing) 2 side, front, top and rear walls form an interior chamber 32 in the container 2. The chamber 32 is formed into two fluid isolated compartments 34 and 36 by interior wall 38. Wall 38 is connected to a flap 40 by fold line 42 and to a flap 44 at a second opposite edge at fold line 46. Rear wall 10 is connected to flap 44 by fold line 48 such that flap 44 is defined by fold lines 46 and 48. Flap 44 is bonded by an adhesive to a portion of wall 14 at wall 14 edge 50, which is coextensive with rear wall 10.

In Figs. 3 and 6, a gas permeable liner 52 comprises three flat panels 54, 56 and 58 joined at right angles by fold lines 60, 62, respectively. Liner 52 is placed in the chamber 32 with panel 54 bonded by an adhesive to the interior surface of rear wall 10. Panel 56 is bonded to the interior surface of side wall 12 and panel 58 is bonded to the interior surface of front wall 8. Panel 54 is bonded to the interior surface of rear wall 10. Any commercially available adhesive may be used. The liner completely covers, surrounds and seals the perimeter portion of the front wall 8 (and rear wall 10) surrounding

the opening formed by panel 20 such as opening 64 (Fig. 2). The liner 52 keeps particles in the compartments 34 and 36 from passing through the openings such as opening 64. The panels 20 serve to protect the carton 2 interior chamber and liner during shipping and handling.

While a U-shaped one piece porous liner 52 is shown, in the alternative, separate liner panels (not shown) may be bonded to the front and rear walls over the panels 20 thereof to seal the openings formed by these panels at the perimeters thereof on the adjacent front and rear walls. The liner 52 thus covers and seals the opening 64 formed by removal of the panel 20 as shown in Fig. 2 in the front and rear walls.

The liner 52 is made of such porous material that air flowing in a conventional refrigerator will readily pass through the liner into the compartments 32 and 34. Conventional refrigerators have fans therein such that air flows freely in the interior of the refrigerator. This flowing air passes through the liner 52 into the chamber 32 compartments. The liner 52 which may be a thin membrane sheet material may be woven or non-woven fabric or paper with sufficient porosity to keep particles in the container without sifting, the particles having a particle size of about 10 microns or larger. The liner also has a bursting strength of preferably about 5-30 pounds per square inch to preclude rupturing in use. Such liners may be rice paper, spun woven mats, synthetic fibers, non-woven fabrics and so on. Reference is made to the aforementioned patent for additional details incorporated by reference herein.

Ethylene is a material which can be readily oxidized to ethanol by powerful oxidizing agents Unfortunately, most powerful oxidizing agents are toxic and of a nature which does not enable them to be placed close to foods A very powerful oxidizing agent is potassium permanganate In addition to its high oxidative capacity, potassium permanganate in crystalline form is deliquescent and tends to stain anything it contacts with an unpleasant brown color.

In order to utilize the oxidative properties of potassium permanganate in a refrigerator, it must be presented in a mode which isolates it from physical contact with the contents of the refrigerator, while allowing contact with ethylene gas which may be present therein. The properties of potassium permanganate are made available under such circumstances by the container 2 of the present invention. The potassium permanganate is adsorbed from an aqueous solution onto zeolite 66, Fig. 3. The zeolite is wrapped in and sealed in a fibrous thermoplastic sheet material 68 which is permeable to air forming a sealed package 70. Such a material is known as Tyvek a registered trademark of _____-.

This Tyvek material is commercially available and is widely used for example as mailing envelopes Such an envelope may be filled with the permanganate adsorbed zeolite and then sealed closed with an adhesive. The permanganate, being toxic, is thus sealed from contact with persons handling the container 2 or foodstuffs in a typical refrigerator. The .package 70 is placed in the smaller compartment 34 of chamber 32, Fig. 3.

Air flows into the compartment 34 through opening (not shown) in the rear wall 10 formed by the removal of the rear wall 10 panel 20 (not shown). The liner panel 54 is sufficiently porous to permit such air flow to occur and yet the liner protects the Tyvek wrapped zeolite package 70 from being directly handled by a user and also isolates the sodium bicarbonate from the potassium permanganate. The package 70 is preferably rectangular in all cross sections and extends across the entire area of the rear wall and interior wall 38. It also extends preferably about 1/10 to 1/8 of the transverse width of the compartment 34.

The compartment 34 may be provided with one or more tabs (not shown) extending inwardly from any of the walls to hold the package 70 in place in the compartment. Such a tab(s) is attached to the rear, interior or side walls as an additional component so as to not form an opening in the

wall or may be otherwis formed in the walls according to a given implementation.

The compartment 36 in the remaining portion of the chamber 32 contains powdered borax or sodium bicarbonate. The amount of this odor absorbent material should be sufficient to provide good absorptive capacity while at the same time maintaining an empty volume above it, to permit the passage of air through the opening 64'. Thus, in operation, the internal fans which are present in most frostless refrigerators, causes internal air circulation in the refrigerator which in turn, passes the air over the borax or sodium bicarbonate whereby the odors are eliminated. Air passes through the opening 64' through the Tyvek pack whereby any ethylene in the air is substantially eliminated. A one pound pack comprising approximately equal parts by weight of sodium bicarbonate and potassium permanganate adsorbed by zeolite will keep a refrigerator substantially odorless and substantially free of internally generated ethylene for a period of about six weeks.

In Fig. 7, the top of the container 2 of Fig. 1 is shown comprising two opposing identical inner flaps 72 and 74 each connected to the respective side wall 12 and 14 by a fold line and living hinge 76, 78, respectively. Outer flaps 16 and 18 are bonded to each other, overlie inner flaps 72 and 74 and form the top wall as discussed above and are also connected to the respective front and rear walls by living hinges formed by fold lines.

In Fig. 8, blank 80 which forms the container 2 of Fig. 1 comprises panels 82, 84, 86, 88, 90, 92 and 94 interconnected by fold lines. Fold line 96 connects panels 82 and 84, fold line 98 interconnects panels 84, 86, fold line 100 interconnects panels 86, 88, fold line 102 interconnects panels 88, 90, fold line 104 interconnects panels 90, 92 and fold line 106 interconnects panels 92, 94.

Panel 82 forms side wall 14, Fig. 3, panel 84 forms front wall 8, panel 86 forms side wall 12, and panel 88 forms rear wall 10. Panel 90 forms flap 44, panel 92 forms inner wall 38 and panel 94 forms flap 40. Flap 40 is glued to the liner 52, panel 56. The liner 52 panel 56 is glued to side wall 12. In the alternative, the liner 52 may be replaced by liners attached only to the front and rear walls and in this case the flap 40 is glued directly to the side wall 12.

Flap 74 is connected to panel 82 by a fold line 78 and flap 72 is connected to panel 86 by fold line 76. In similar fashion, the walls and flaps are all interconnected to the panels as shown by fold lines represented in this figure by relatively long dashed lines such as lines 108. Perforations forming separation cuts are shown as small dashed lines 110 forming removable panels 20'. The bottom wall 6 of the container is a mirror image of the top wall 4 and has corresponding flaps as shown in figure 8.

While the compartments 34 and 36 have been illustrated in one embodiment, these compartments may have any relative shape, size and orientation as will meet a given need. The compartments while shown vertical may be horizontal. The Tyvek wrapped zeolite may be placed in any size compartment according to a given implementation. For example, the zeolite and permanganate may be placed in an inner box located in an outer box, the inner box having a permeable wall. The openings in the outer container permit air flow into the container chamber wherein the air may contact the inner box. The outer container in this case has only one opening such as opening 64 in one of the outer walls. Air flows into the interior and passes through an opening in the inner box into the compartment thereof to oxidize the ethylene gas.

In the alternative, the interior wall may have an opening therein sealed by a permeable liner such as opening 64 and liner 52 for providing fluid communication between the two compartments. In this case, the container forming a housing for the chamber need have only one opening such as opening 64 in one wall thereof. This opening provides air flow to both

compartments via the opening in the interior wall. The particles in the compartment next to the opening in the container wall does not fill the compartment completely so that air flows freely to the inner wall opening into the other compartment.

In a further alternative, the permanganate absorbed zeolite need not be wrapped in an outer wrapping but may be placed directly into its compartment.

In Figs. 9 and 10, a container 110 according to a further embodiment comprises a pressed paper board one piece construction. Container 110 has a front wall 112, a rear wall 114, a top wall 116, a bottom wall 118 and two opposing side walls 120 and 122. Container 110 has an interior cavity 124 that is divided into two fluid isolated compartments 126 and 128 by interior wall 130. Zeolite with adsorbed permanganate (not shown)0, with or without a Tyvek material wrapping, is placed in compartment 128. Sodium bicarbonate or other odor absorbing material is in compartment 126. Not shown is the permeable liner inside the compartments.

Through perforations 132 and fold line 133 form a tab 134 that is partially on the top wall 116 and partially on the side wall 120 extending about the corner 132 of the top and side wall. Separation of the tab 134 at the perforations 132 and folding the tab at fold line 133 exposes the compartment 126 and sodium bicarbonate (or borax or other material as desired) to the ambient atmosphere. The compartment 126 with the zeolite is in fluid isolation from the ambient atmosphere at this time. A removable panel 136 is formed by through perforations 136 in the rear wall 114. Removing the rear wall panel 136 exposes the zeolite to the ambient atmosphere.

An optional liner (not shown) may be sealed to the interior of walls 116 and 120 coextensive with the tab 134. With no liner present, the sodium bicarbonate may be readily refilled in the compartment 126 as needed. A liner is provided coextensive with the opening 138 formed by removal of the

panel 136. Opening 138 exposes the zeolite to the ambient atmosphere independently of the exposure of the sodium bicarbonat due to the fluid isolation of the respective compartments.

In Figures 11 and 12, container 140 has an interior planar wall 142 dividing its interior chamber into two isolated compartments 144 and 146. Zeolite is in compartment 144 and sodium bicarbonate is in compartment 146. The container 140 has a top wall 148, a rear wall 150 and a front wall 152. The compartment 144 is formed in part by the rear wall 150 and the compartment 146 is formed in part by the front wall 152. A unitary tab 154 is formed in the front, top and rear walls. The tab 154 is formed by a continuous set of tear through perforations 156 in the front, top and rear walls. The tab 154 has a relatively smaller rectangular portion 158 in the front wall 152, a V-shaped portion 160 in the top wall 148 and a large panel portion 162 in the rear wall 150. Panel portion 162 is approximately 50-80% of the area of the rear wall. A permeable liner (not shown) is in side the container sealed to the interior of the rear wall 150 about the periphery of the opening 164 formed by panel portion 162. In use, the entire tab 154 is separated at the perforations 156 to open the two compartments 144 and 146 to the ambient atmosphere.

In the embodiment of Fig. 13, container 166 has a rear wall 168, a top wall 170 and a front wall 172. An interior wall 174 is in the container chamber forming fluid isolated compartments 176 and 178. Permanganate adsorbed zeolite 180 is in compartment 176 and sodium bicarbonate 182 is in compartment 176. A removable panel 184 is formed by through perforations 186 in the rear wall 168. The panel 184 is coupled to a tab 165 formed by through perforations. The panel 184 is removed by first opening the tab 165 to provide access to the panel 184. The panel when removed forms an opening 167. The opening 167 is about 50-80% of the area of the rear wall 168. The opening 167 provides fluid communication between the ambient atmosphere and the compartment 178.

An L-shaped tab 169 is formed in top wall 170 and front wall 172 by through perforations 171. Removal of the tab 169 provides fluid communication between the ambient atmosphere and the compartment 176 containing the sodium bicarbonate.

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It will occur to one of ordinary skill that various modifications may be made to the disclosed embodiments without departing from the scope of the invention as defined in the appended claims. The description given herein is given by way of illustration and not limitation.

CLAIMS

What is claimed is:

1. A container for receiving material for absorbing odors and ethylene comprising:

a housing forming an enclosed chamber; and

means forming the chamber into first and second fluid receiving compartments, the first compartment for receiving the odor absorbing material and the second compartment for receiving the ethylene absorbing material, the housing having a first removable panel forming a first opening for providing air flow from the ambient atmosphere into the first compartment, a second removable panel coupled to one of the housing and second compartment forming a second opening in the housing or second compartment for providing air flow from the ambient atmosphere into the second compartment.

2. The container of claim 1 including a gas permeable liner coextensive with at least one of the first panel and with the second panel and sealed to the one of the housing and second compartment to preclude powder particles from passing through at least one of the first and second openings upon removal of the at least one first and second panels while permitting gas to flow into the compartments.

3. The container of claim 1 wherein the one of the housing and second compartment has a second wall with the second panel therein for providing fluid communication into the second compartment.

4. The container of claim 1 wherein the housing comprises one piece paper board.

5. The container of claim 1 further including an oxidant for placed in the second compartment.

6. The container of claim 5 wherein the oxidant is selected from the group consisting of Potassium and Sodium Permanganate ($K/NaMnO_4$), Periodic Acid (H_5IO_6), Calcium Permanganate ($Ca(MnO_4)_2$), and Potassium Iodate (KIO_3),

7. The container of claim 6 wherein the oxidant is potassium permanganate adsorbed into zeolite and wrapped in a permeable plastic film placed in the second compartment.

8 The container of claim 5 further including odor absorbing powdered particles in the first compartment.

9. The container of claim 8 wherein the odor absorbing powdered particles are selected from the group consisting of Borax (sodium Tetra borate $B_4Na_2O_7$), Activated Charcoal (Carbon, Amorphous), Calcium Permanganate ($CaMn_2O_8$), Potassium Bicarbonate ($KHCO_3$), Silica Gel. (Precipitated Silica Approx. H_2SiO_3), Calcium Chloride ($CaCl_2$) and Calcium Hypochlorite ($CaCl_2O_2$)

10. The container of claim 8 wherein the odor absorbing powdered particles are sodium bicarbonate.

11. The container of claim 1 wherein the means forming the chamber into first and second compartments includes an interior wall fluid isolating the first and second compartments, the first and second panels for providing independent fluid flow into the respective corresponding compartments.

12 The container of claim 11 wherein the first and second panels are on opposite walls of the housing, the interior wall preventing fluid flow between the first and second compartments.

13 The container of claim 11 wherein the housing has top and bottom walls, a front wall and a rear wall and two opposing side walls interconnected to form said chamber, the side, front and rear walls hinged to each other by fold lines, the interior wall being hinged to one of the side, front or rear walls by a fold line, and the top and bottom walls being formed by flaps hinged to selected side, front and rear walls by fold lines.

14. The container of claim 1 including sodium bicarbonate in the first compartment and potassium permanganate in the second compartment.

15. The container of claim 14 including means for isolating the sodium bicarbonate from the potassium permanganate.

16. A container comprising:

a housing forming a chamber;

means for dividing the chamber into first and second compartments;

means for permitting ambient atmosphere air flow into the first and second compartments;

means for absorbing odor in the first compartment; and

means for absorbing ethylene in the second compartment.

17. The container of claim 16 including means for fluid coupling the compartments to the ambient atmosphere.

18. The container of claim 16 including means for fluid coupling the compartments to each other inside the chamber and to the ambient atmosphere through at least one opening in the housing.

19. The container of claim 16 including means for fluid coupling each compartment to the ambient atmosphere.

20 The container of claim 16 wherein the ethylene absorbing material is selected from the group consisting of Potassium and Sodium Permanganate ($K/NaMnO_4$), Periodic Acid (H_5IO_8), Calcium Permanganate ($Ca(MnO_4)_2$), and Potassium Iodate (KIO_3),

21 The container of claim 16 wherein the ethylene absorbing material is potassium permanganate adsorbed into zeolite and wrapped in a permeable plastic film.

22. The container of claim 16 wherein the odor absorbing material is selected from the group consisting of Borax (sodium Tetra borate $B_4Na_2O_7$), Activated Charcoal (Carbon, Amorphous), Calcium Permanganate ($CaMn_2O_8$), Potassium Bicarbonate ($KHCO_3$), Silica Gel. (Precipitated Silica Approx. H_2SiO_3), Calcium Chloride ($CaCl_2$) and Calcium Hypochlorite ($CaCl_2O_2$)

23. The container of claim 16 wherein the odor absorbing material is sodium bicarbonate.

24. The container of claim 19 including means for fluid isolating the compartments from each other.

25. The container of claim 16 wherein the means for dividing comprises at least one interior wall in said chamber.

26. The container of claim 25 wherein the at least one interior wall physically isolates material in the first and second compartments, the means for permitting comprising at least one opening in the housing to provide fluid

communication to the first compartment and at least one further opening in at least the housing or interior wall to provide fluid communication to the second compartment.

27. The container of claim 25 wherein the means for permitting comprises first and second openings in the housing, the first opening for providing fluid communication to only the first compartment, the second opening for providing fluid communication to only the second compartment.

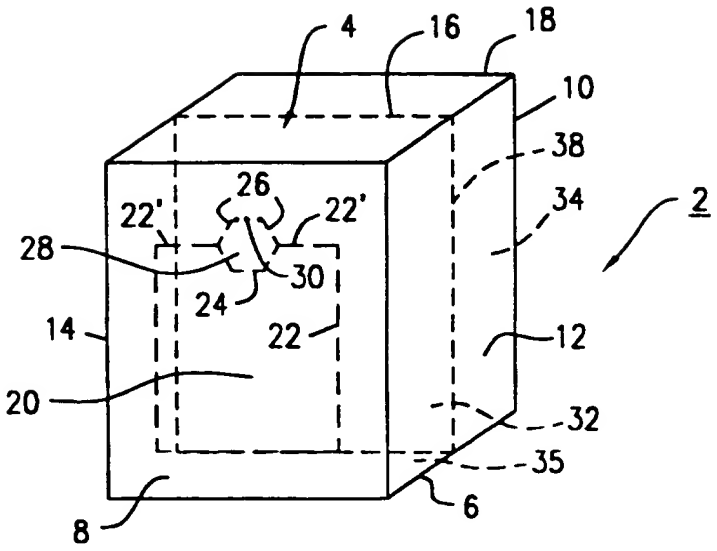

FIG. 1

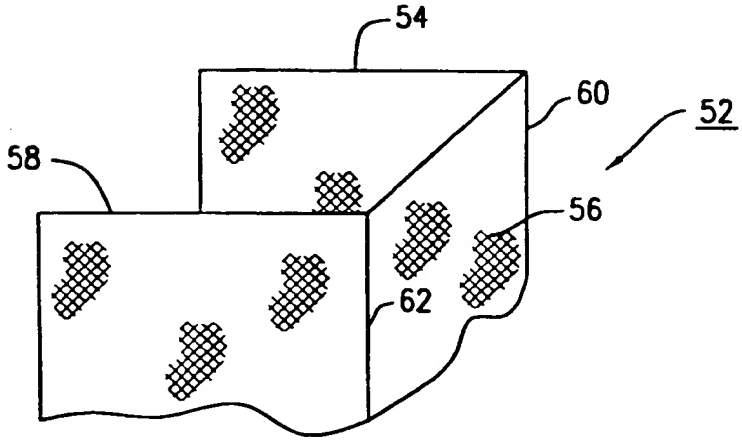

FIG. 6

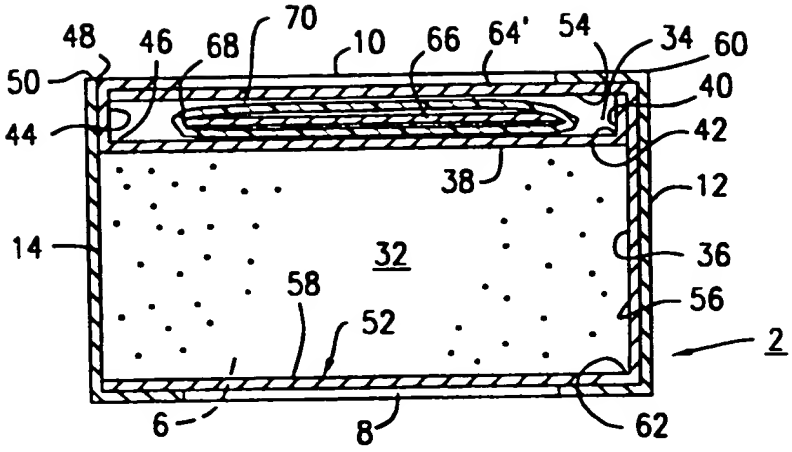

FIG. 3

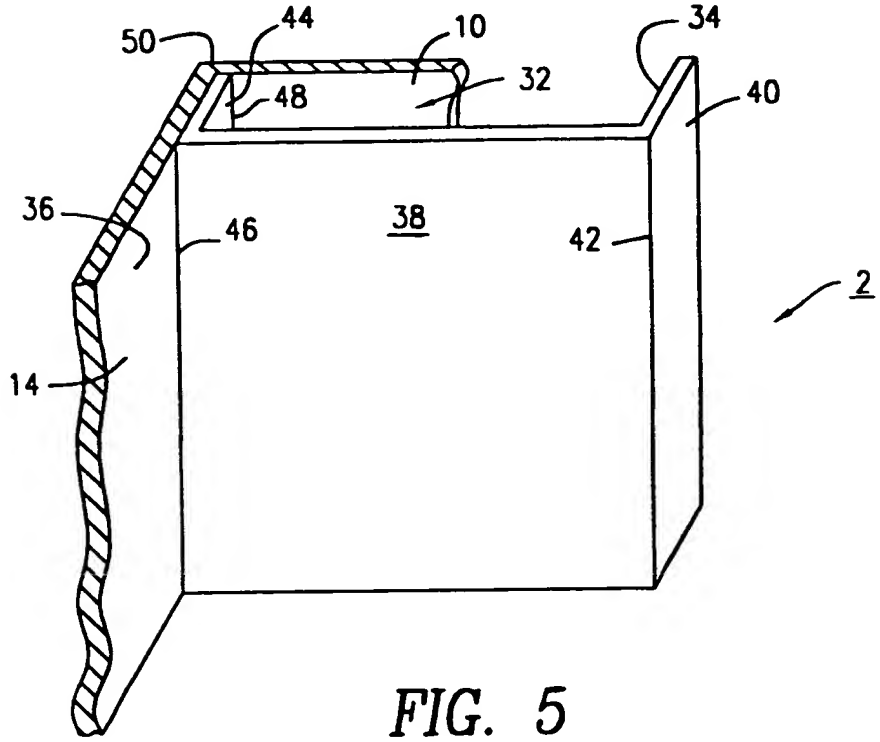

FIG. 5

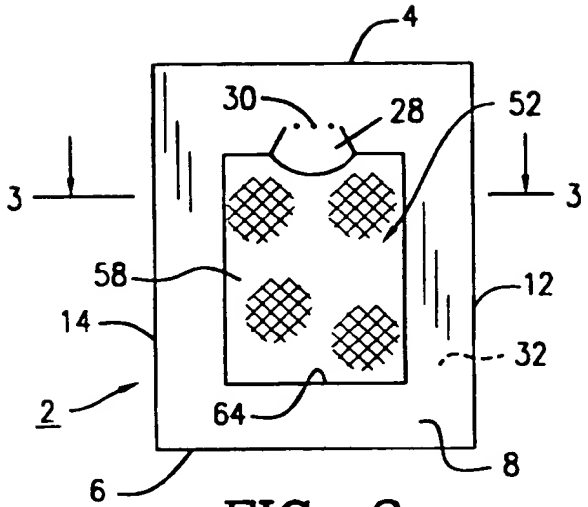

FIG. 2

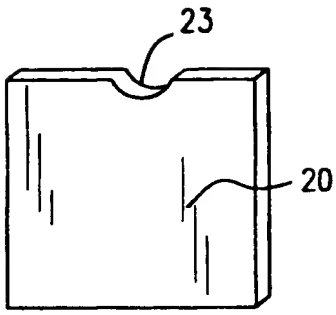

FIG. 4

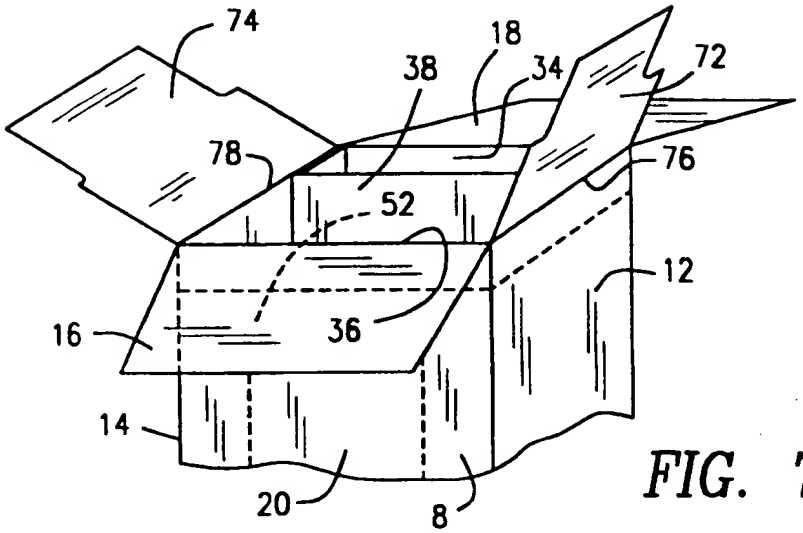

FIG. 7

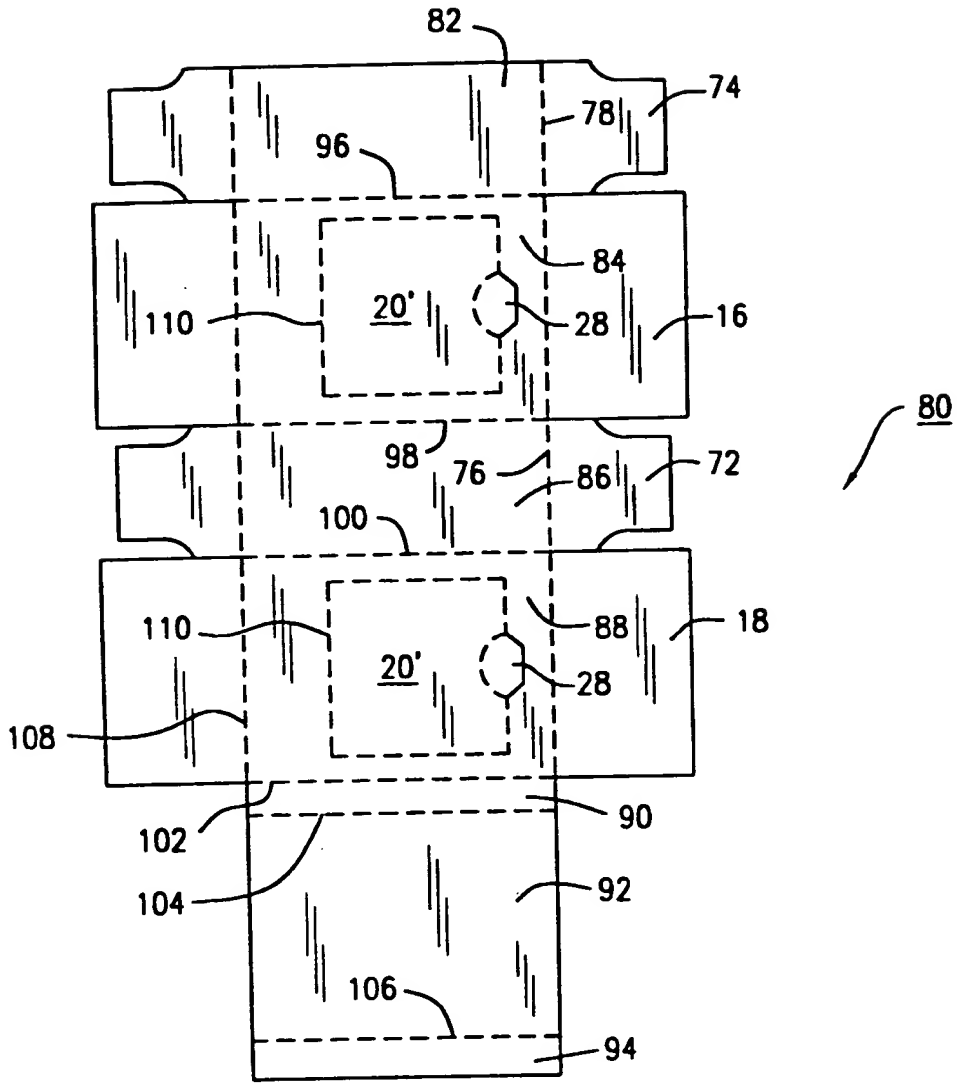

FIG. 8

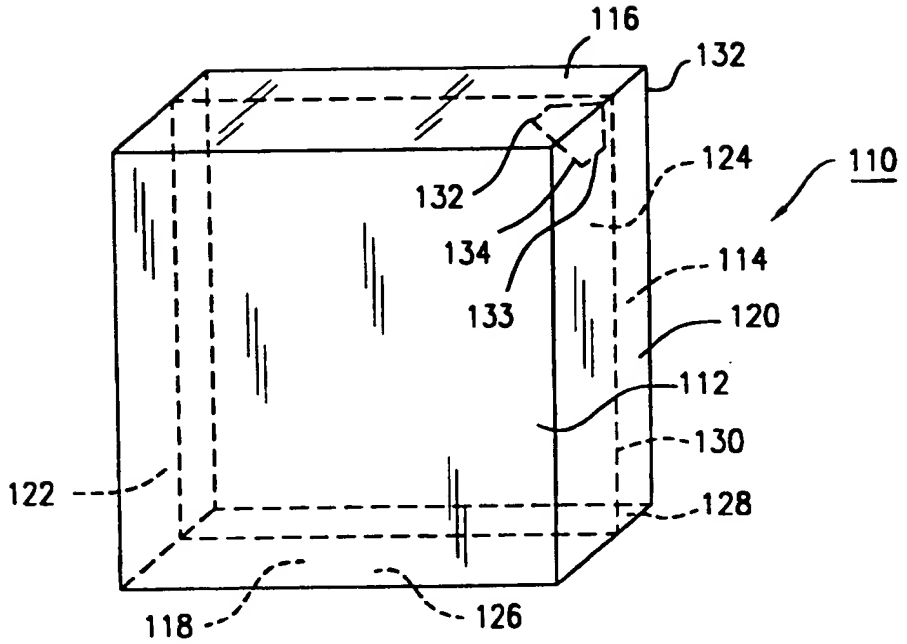

FIG. 9

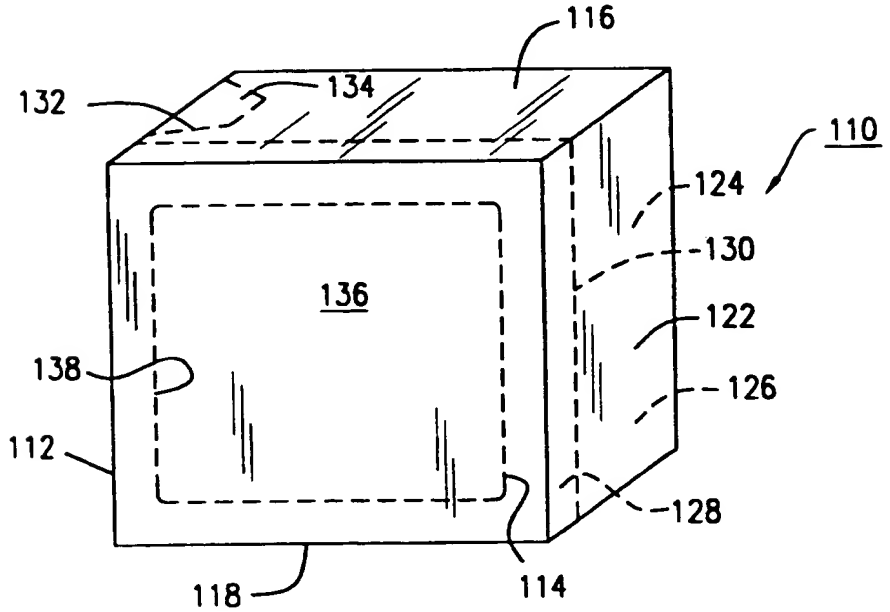

FIG. 10

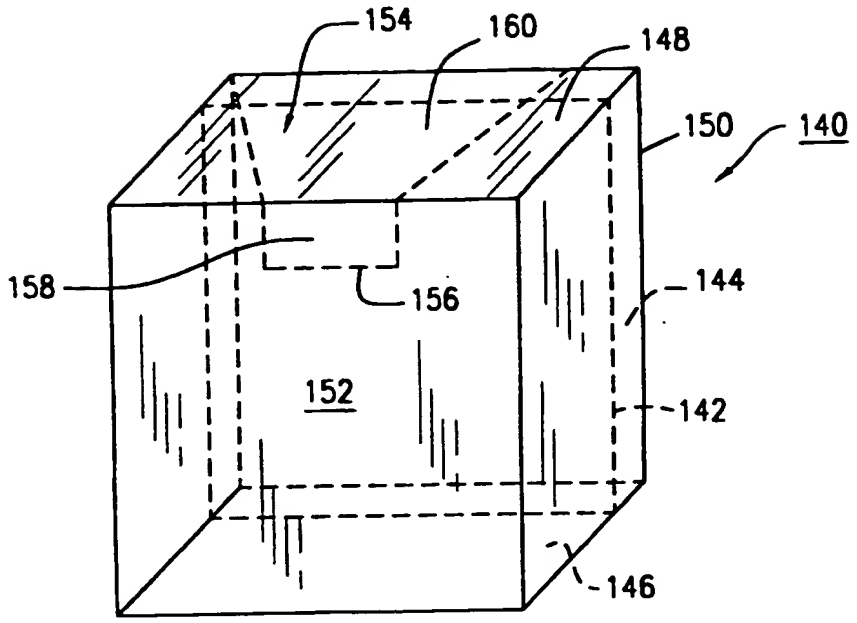

FIG. 11

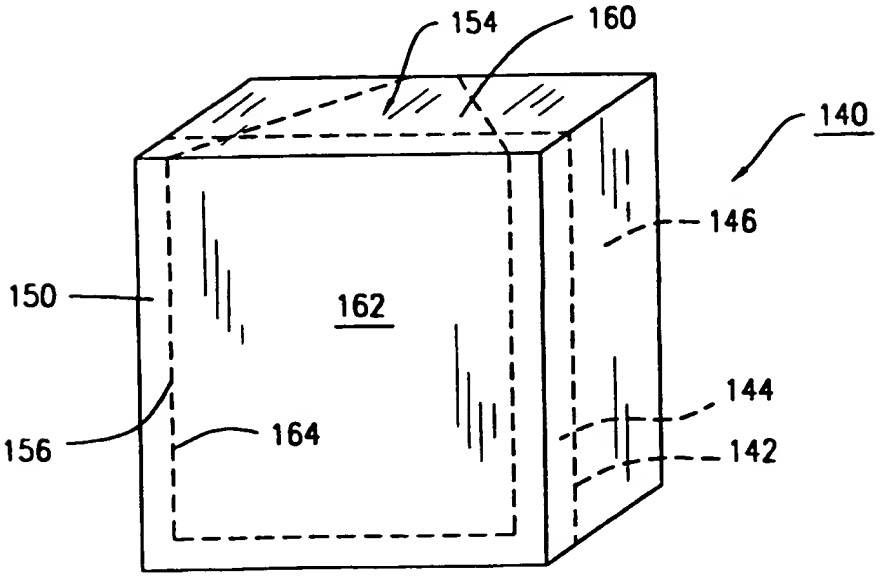

FIG. 12

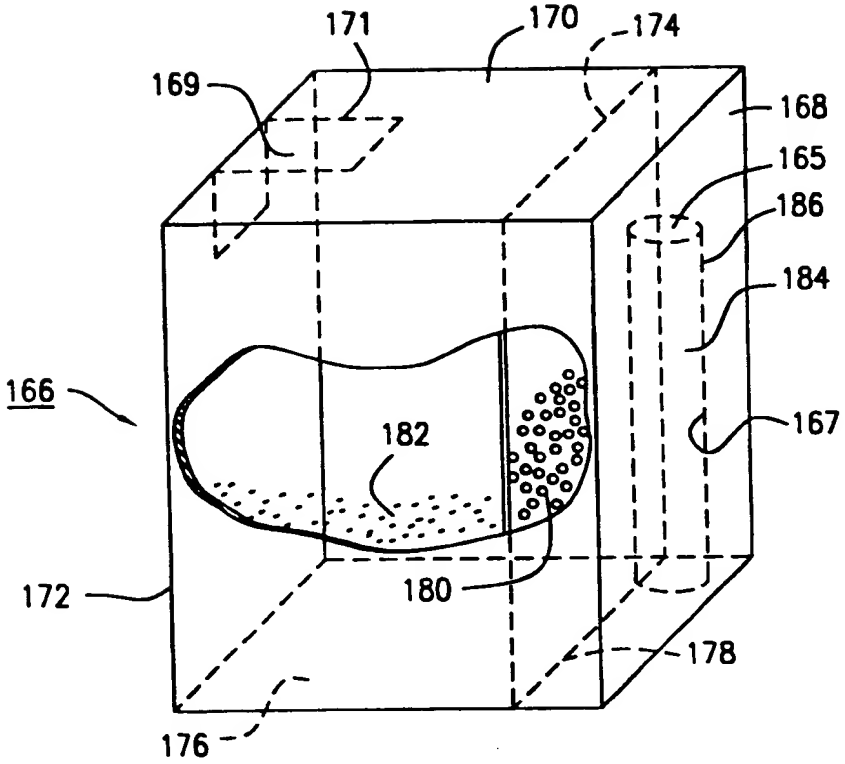

FIG. 13

INTERNATIONAL SEARCH REPORT

I. ational Application No
PCT/US 00/29425

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B65D5/48 B65D5/42 B65D81/26 A23L3/3427

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 B65D A23L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
WPI Data, PAJ, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Y Y	column 3, line 1 - line 9; claims column 1, line 36 - line 42; figures column 2, line 33 - line 44 column 3, line 18 - line 45	3,5 9

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Y	EP 0 261 422 A (NIPPON KAYAKU KK) 30 March 1988 (1988-03-30) page 3, line 49 -page 5, line 52; examples 53-61	9

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
23 January 2001	08/02/2001

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Guyon, R

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 00/29425

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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Information on patent family members

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